Advanced Machine Learning
CAP 6617   Section 9ZYX
Class Periods: Tue. Period 8—9 (3:00PM—4:55PM) Thu. Period 9 (4:05PM—4:55PM)
Location: MCGA G186
Academic Term: Fall 2025

Instructor:
Kejun Huang
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Office Hours: by appointment, Malachowsky 3119

Teaching Assistant/Peer Mentor/Supervised Teaching Student:
Please contact through the Canvas website
- No TA

Course Description
Concepts in developing computer programs that learn and improve with experience. Emphasis on methods based on probability, statistics, and optimization.

Course Pre-Requisites / Co-Requisites
Machine Learning (CAP 6610)

Course Objectives
Understanding the formal and technical aspects underlying current Machine Learning techniques for supervised and unsupervised learning, including regression, classification, clustering, embedding, and neural networks.

Materials and Supply Fees
None.

Required Textbooks and Software
None.

Recommended Materials
- *Machine Learning: A Probabilistic Perspective*, Murphy, ISBN: 9780262018029
- *Pattern Recognition and Machine Learning*, Bishop, ISBN: 0387310738
- *Deep Learning*, Goodfellow, ISBN: 9780262035613

Required Computer
Recommended Computer Specifications: https://it.ufl.edu/get-help/student-computer-recommendations/
HWCOE Computer Requirements: https://www.eng.ufl.edu/students/advising/fall-semester-checklist/computer-requirements/

Course Schedule
Week 1-2:   Regularized empirical risk minimization
Week 3-4:   Gradient-based algorithms
Week 5:   Stochastic subgradient algorithms
Week 6:   Duality
Week 7-8:   Kernel methods
Week 9:   Dual algorithms
Week 10:   Concentration inequalities
Week 11-12:   Learning theories
Week 13-14:   Representation learning

Important Dates
Oct. 28   Midterm (3-5pm, MCGA G186)
Dec. 3   Project Due

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework Sets	100 each	40%
Midterm Exam	100	20%
Final Project	100	40%
		100%

Grading Policy
The following is given as an example only.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

Academic Policies & Resources
To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: https://go.ufl.edu/syllabuspolicies. Instructor-specific guidelines for courses must accommodate these policies.

Commitment to a Positive Learning Environment
The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Coordinator
• HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
• Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu